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SPECIAL ARTICLES

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The Public Health Journal

Vol. XI. JUNE, 1920 No. 6

Industrial Hygiene

By J. W. S. McCullough, D.M., D.P.H.

Chief Officer of Health, Ontario.

Read before the Annual Meeting of the Ontario Safety League, Toronto, April 13th, 14th, and 15th.

I HAVE been invited to speak to you on the subject of Industrial Hygiene, which is a most important branch of preventive medicine, having to do with a large proportion of the population, the workers so-called. Most of us, except the very wealthy, are obliged to work, but while the well-to-do may choose their work, their manner of working, and their environment, the poorer amongst us often have to work to keep body and soul together at anything which will bring the means of livelihood, at trades which are unhealthy, in poor quarters and under conditions which take a toll of life and health greater than the actual work itself. It is in the utilization of the principles of industrial hygiene that work and the conditions of work may be improved and the worker, compelled to seek occupation in unhealthy industries, may find the conditions so improved that the dangers to his health and life may, in so far as possible, be mitigated or removed.

Workers on this continent have so far failed to reap the benefits of industrial hygiene to the extent these benefits have accrued to the workers of England and the continent. Some assistance has come through the efforts of organized labour which has exerted a good influence in limiting the avarice of the employer, in shortening the hours of labour, in increasing wages, and in the improving of sanitary conditions, but much remains to be done.

Modern conditions of labour are very different from those of a century a half-century or even of a generation ago. Machinery has worked miracles in labour, but with machinery has come increased danger to life. Of all the labour-saving machines invented, however, there is none so

vital and indispensable in the production of wealth as the human machine —and at the same time there is none so sensitive and delicate. Both from the standpoint of humanity and the standpoint of economy the human machine deserves greater care and consideration than any other mechanism engaged in the production of wealth. Yet it is a fact that while the ordinary machine is oiled, cleaned and cooled and kept in the most careful repair, the human machine is expected to run day in and day out with no particular care on the part of the employer that this delicate mechanism shall be kept in constant repair. It has been the habit to work the human machine for all it is worth, which when worn out and dies, is forgotten the next day.

Certain industries are particularly dangerous to health, such as lead-poisoning in the manufacture of white lead, in painting, and in type-setting; of the phossy jaw in the use of white phosphorus; of caisson disease in divers and compressed air workers; in railroading, mining and among workers with explosives; there is particular danger to those working in dusty atmospheres, in the fumes of carbon monoxide, hydrogen sulphide or mercury. Certain diseases set up nervous conditions and infectious diseases such as anthrax, glanders, and hookworm, are acquired in certain occupations. Influences such as improper light, poor ventilation, lack of cleanliness, overcrowding, excessive hours, fatigue, and a hundred and one conditions may affect the health and efficiency of the worker.

The losses consequent upon the failure to maintain healthy conditions in places of employment fall upon both the employee and the employer. The former loses his health, the latter loses financially from the want of efficiency of the employee. It is well-known that the number of industrial accidents increase progressively as the day progresses, being fewer in the early morning, increasing towards noon, dropping after the noon period and again increasing towards evening. Thus it is seen that fatigue becomes a factor in accidents. Overwork is found to be a danger not only to the worker himself, but also to the public, whose lives may be endangered by the overworked train despatcher, trainman, conductor or engineer.

Minors

Most countries have laws limiting the age at which minors may go to work. This is a valuable measure not only for the protection of the health of children, but also in the interest of their education and development. Certain of the more dangerous trades should not be open to minors, such as lead-working, bronzing and cutlery grinding, naphtha works, textile factories, melting and annealing glass and many others.

Women

Women are not physically capable of doing the same work as men, particularly during the period of maternity and during menstruation. This is important not only in the interest of women alone, but it has an important bearing on the future of the race, it being well-known that the life and strength of the unborn child makes it necesssary that women should be exempt from severe labour for several weeks before and after labour, the latter particularly because the baby needs the care and attention of its mother in order to thrive properly. Experience in the Lancashire district of England during the cotton famine and in the seige of Paris showed that in spite of privation the rate of infant mortality fell greatly—in Paris 40 per cent. below that of normal times, and in industrial centres like Fall River, Lowell and Lawrence, the infant mortality rate is twice as high as in similar towns without factories and no overcrowding.

No woman should be permitted by law to work at a dangerous trade. Saleswoman should be provided with seats and should have one or two day's rest each month. Women's work in the home needs supervision. Their work is "never done" and its results are seen in the anaemic, tired and worn faces of housewives which may be observed in every street of the city and in every country district. The long hours and close confinement of domestic servants, the excessive heat in cooking, the unventilated sleeping quarters, send large numbers of this class to hospitals and outdoor clinics.

Factory Inspection

Factory inspection under a proper law and with inspectors who are familiar with the law, the process of manufacture, and having a good knowledge of preventive medicine is of the greatest value to the worker. The factors of ventilation, dust, gases, odors, temperature, moisture, light, cleanliness, overcrowding, drinking water, child workers, washing and toilet facilities to the proper capacity, hours of work and rest, are among the many which should engage the attention of the inspector. Physicians make the best inspectors, because they should know more about health conditions.

Preventable Accidents

Of the preventable accidents those on railways, in mines and factories are the commonest and most striking. On this continent there are something like 30,000 deaths of wage earners and 500,000 or more seriously injured in our industries every year. There are in America over 3,000 deaths annually of those engaged in mining operations. Much

of this appalling disaster can be prevented. Fatalities are four times as common on our railroads as upon those in England. Indeed, a railway disaster with us is an accident; in England it is a crime. In Belgium the death-rate in mines since 1840 has been cut to one-third of what it was in the previous decade.

Some special injuries incident to work are:

Spinal curvature from faulty posture; flat feet and varicose veins from prolonged standing, as in nurses and shop girls; injuries to the eyes from metal splinters or stone fragments; impairment of eyesight from poor lighting; eye strain in garment workers and miners; rupture of the eardrum in compressed air workers; ear disease in boilermakers and gunners; injuries to the skin by violence and in laundries; chilblains in cold storage workers; ulcers in X-ray or radium operators, most of which is preventable.

Lead

In considering the various factors productive of injury to health of industrial workers, much of which may be readily prevented, that of lead poisoning is one of the most frequent, dangerous and insidious of all the occupations of man. We are apt to be impressed by an accident which has immediate and fatal consequences. For example, a pound of lead dropped from a height upon a man's head may easily prove fatal, but the daily ingestion of minute quantities of lead salts while slower, is equally fatal if means of prevention are neglected. The general population is liable to lead poisoning from various sources, such as drinking water conveyed by lead pipes; in canned goods from the solder; from foods cooked in lead-enameled utensils, or from handling lead or objects containing lead. Painters are very liable to lead poisoning. Young persons and women are also very liable to lead poisoning, and as long ago as 1898 English law abolished female labour in the processes of the manufacture of white lead. Persons with hyperacidity of the stomach, those who fail to thoroughly cleanse their hands before eating, and alcoholics have no business dealing with lead. The most dangerous lead industries are the processes involved in the manufacture of red lead, the fumes and dust of which are dangerous, in white lead manufacture, from the dust raised in stripping the "white bed" and in the manufacture of pottery and earthenware in which the dangers from lead poisoning and lung disease such as "potter's asthma" are very great. The dust raised in file-cutting carries a large proportion of lead, and besides, considerable is carried from unclean hands in the process of this industry.

Besides the dangers from lead poisoning in the industries already mentioned, there are upwards of 100 others in which lead is more or less used and with consequent danger to the worker. Some of these are:

Making and selling wallpaper; polishing brass and nickel; finishing cut-glass; holding lead-covered nails while shingling; working with aluminium foil in lithography; wrapping cigars in tinfoil; enameling bath tubs; stopping holes in wood with white lead; assembling and recharging storage batteries; diamond cutting; painting and printing trades.

Prevention of Lead Poisoning

The lead reaches the mouth and eventually the digestive tract of the worker through fumes and dust and from hands, particularly about the finger-nails of the careless workman. Consequently the ventilation of the factory must be ample and hoods should be provided with suction fan to carry off the dust and fumes. For the workman himself education is necessary. He should be taught the dangers of unclean hands, particularly at meal times. He should bathe the body frequently and have special clothes in which to work, for there is reason to believe that a certain amount of lead salt is absorbed by the skin.

Much may be done by giving advice to employees and employers along the following lines:

Employees

To prevent lead poisoning obey the following rules:

(1) Personal cleanliness
2) Clean hands
(3) Rinse mouth before eating
(4) Take a good breakfast; an empty stomach invites lead poisoning
(5) Never eat, smoke or chew tobacco while at your work
(6) If possible, eat outside the work room
(7) Avoid all excesses, especially alcohol
(8) Wear overalls or a long coat at work, gloves and cap
(9) In white lead or dusty lead work wear a respirator
(10) Consult a physician at first sign of trouble.

Employers

To prevent injury to employees:

(1) Provide washing facilities, lockers and out-of-workshop eating places
(2) Provide respirators for workmen
(3) Clean floors and benches of workshops, first moistening them
(4) Post up both regulations in conspicuous places in workroom.

Phosphorus

The next important poisonous trade is the manufacture of matches, the danger being from the use of phosphorus in the process. There are two kinds of phosphorus, the white or yellow and the red or amorphous.

The former is the dangerous one, and is used in the manufacture of the common strike-anywhere-match. The safety match contains no phosphorus. It contains potassium chlorate or chromate and the paste on the side of the box contains antimony sulphide and red phosphorus. Friction of the one against the other produces a light. The common match contains the poisonous white phosphorus in the lead with glue, chlorate of potash, powdered glass and some colouring matter. There is another strike-anywhere-match which has the non-poisonous sesquisulphide of phosphorus in the lead. These matches have been used exclusively in France for the last 12 years.

The disease caused by white or yellow phosphorus is a necrosis of the jaw called the "phossy jaw." It begins as an inflammatory infection which runs a chronic course and causes localized death of the bone. So dangerous is the disease that in Belgium a prize of 50,000 francs was offered by the Government to whoever would invent a strike-any where match free from white phosphorus. The prize was won by two Frenchmen and the match is used entirely in some continental countries.

Prevention

(1) By the prohibition of the use of white or yellow phosphorus in matches. This was done in Great Britain in 1908. In many continental countries its use in the manufacture of matches is prohibited. In 1913 a prohibitive tax upon white phosphorus was adopted in the United States.

(2) By medical and dental inspection and treatment of carious teeth.

(3) By personal cleanliness and the use of mouth washes.

(4) By proper ventilation of factories, and provision for washing facilities.

Arsenic

Arsenic is used to a large extent in certain industries. This chemical is an irritant to the skin and mucous membranes setting up inflammation of the eyes, eczema and ulceration of the skin, general poisoning and neuritis.

Some years ago the writer then engaged in medical practice was called to see a man, who with his wife was visiting his wife's relatives. He was ill of vomiting and diarrhoea; his eyes were swollen and his hair was falling. Treatment of the digestive disturbance gave relief for a few days when the symptoms would break out afresh. Careful examination led to the belief that he was suffering from arsenical poisoning and suspicion attached to the wife, but proof was lacking. A nurse was procured who was instructed to allow the sick man nothing but what she gave him. This was much resented by the wife who was quietly told that her hus-

band was being poisoned, and that if she interfered suspicion would probably attach to her. Subsequently to the engagement of the nurse the sick man improved and it was discovered that the husband had been dosed with an infusion of Wilson's fly pads. The man recovered completely and the wife was warned that any recurrence of his malady would land her in gaol. They lived (so far as I know) happily ever afterwards.

Arsenic is found in wallpaper, painted toys, gloves, ribbons, calico, artificial flowers and many colours, confectionery, etc.

Arsenical poisoning is found among workers in the manufacture of Scheele's green, wallpapers, artificial flowers, in the packing of white arsenic and reduction of arsenical ores, in curing furs, in paperhangers, milliners and handlers of Paris green, the latter of which is in common use for suicidal purposes. Free ventilation and clean hands are the best means of prevention.

Mercury

Workers in mercury acquire anaemia, headache, dizziness, tremor of muscles, fetid breath, swollen gums, loose teeth, depression and melancholy. A persistent and apparently causeless diarrhoea is frequently a symptom of mercury poisoning.

Prevention

Similar to that for lead.

Carbon Monoxide

CO is colourless, odorless and highly poisonous gas which burns with a pale blue flame. It is the source of the blue flame seen on the surface of an ordinary coal fire. It is a gas given off in large quantities by coke ovens from blast furnaces in smelting iron, from hot water heaters, and is the cause of the deaths from ordinary coal self-feeders that one reads of in the newspapers during the winter months. Likewise, it is a product of the gasoline engine, and is the cause of death in the fatalities in public and private garages.

In the coke ovens of England, where men are obliged to enter to clean them out, two men always go together, one stands by in case of accident.

Time will not permit to describe in detail the many poisonous trades and the means of the prevention of accident and fatal results, but there may be mentioned hydrogen sulphide gas, a very stinking gas noticeable about privies which in the small quantities inhaled usually do no worse than cause nausea or headache, but which in large amounts may, if inhaled, cause death. Others of a more or less dangerous character are benzene, used in a variety of trades, aniline used in the manufacture of rubber goods, etc., as well as dozens of others.

Dusty Trades

Much ill-health is caused by the inhalation of dust in various trades. Some are poisonous, others act as mechanical irritants. The poisonous dusts have already been referred to, such as those of lead, arsenic, mercury, phosphorus, tobacco, wood, dyes and chemical works. The mechanical irritants are particles of iron, steel and other metals, granite and marble, coal, chalk and plaster of paris. The significance of the latter will be seen in the fact that while but 2.39 persons per 1,000 die of consumption in occupations without dust production the rate in stone-workers is 34.9 per 1,000.

Prevention

Much of the dust raised in industrial processes may be limited by proper machinery or preventive devices. Thus moisture or working the process under water may serve to keep down the dust, or wet grinding may be substituted for dry. Inclosed hoods with suction fans may be used to confine and suck away the dust. Good ventilation helps much. Respirator masks are required in some trades.

Textile Work

The danger from the dust and excessive humidity necessary in the work of textile mills may be largely removed by good ventilation, abundant airspace, cleanliness, good light and the use of improved machinery. The moist garments used in textile works should be changed for dry ones before going out in the cold air.

Wood Dust

Wood dusts, particularly those of boxwood, teak and redwood, have all an ill-effect on the worker, the alkaloids in these woods producing bronchitis and asthma.

Coal Mining

As we sit beside the coal grate in the stormy winter's night we rarely give much thought to the men who mine the coal in the bowels of the earth. We give more thought to the headlines in the paper indicating the rise of coal to unheard of prices, the exhorbitant (?) demands of the miners and how much rise of salary we must have to meet the high cost of coal and other incidentals in the high cost of living. We should not forget that the mining of coal is a most dangerous and unhealthy occupation. The underground work means poor ventilation, exposure to poisonous gases, and risk to life and limb. Sanitary conditions, though

improved of late years are still bad enough. The disposal of excreta is not well-managed in all of the mines, and this fact predisposes, particularly in the south to the development of hookworm infections, especially where the use of moisture in the mine is favoured for the prevention of explosions. The dust of coal is productive of a lung disease called "coal niners' phthisis (consumption)." This is not a tuberculosis like ordinary consumption, and besides backache, troublesome affections of the hands, knees and elbows are the fate of miners. The irritation of the dust is productive of cancer in some cases. Better ventilation, lighting, sanitation, shorter hours and better pay will cure many, but not all of the needs of the coal miner.

Effects of Heat

In the trades of firemen, stokers, workers in foundries and steel mills the excessive heat is productive of much illness, such as heat stroke and prostration, nervous diseases, anaemia, indigestion and kidney affections. Injury to the eyes occur in many cases as well as respiratory diseases and skin affections.

Infections

The infections acquired in trades are anthrax or wool-sorter's diseases from hides and hair, hookworm disease from pollution of the soil from fecal matter, glanders from horses and indirectly, tuberculosis. Of these the most important for us to consider in this place is perhaps anthrax, of which there are a few cases in Ontario every year, mostly in large tanneries where hides, imported from South America are treated. This affection may be prevented by the immersion of the hides (using gloves for the purpose) for five minutes in a 5 per cent. carbolic acid. Hair of various kinds may be disinfected by steam at 17 lbs. pressure for one hour, or by boiling for quarter of an hour in 2 per cent. solution of potassium permanganate and bleaching in a 3 or 4 per cent. solution of sulphurous acid, or by boiling in water for two hours.

Tuberculosis

This disease is often spoken of as the most important disease of occupation. It is at any rate the most important single problem in industrial hygiene. There is no doubt that dusty trades, poor ventilation, badly ventilated workrooms, sedentary occupations, fatigue, irritating fumes and long hours predisposes to the disease, but it is generally regarded that tuberculosis is contracted in infancy and childhood, manifesting itself later in life. The disease is unusually prevalent among grinders, engravers, compositors, stone-cutters, millers, bakers, plasterers, brassworkers, glass-cutters, furriers, weavers and other trades having a large amount of dust.

Physical Examination

There is no provision for the physical examination of workers and particularly of boys and girls just past the legal working age of 14 years. There is great need for such examination in order that men and women who for reasons of health may be quite unfit for certain kinds of work may be protected, that pre-tuberculous cases in young and old may be detected and proper means of treatment provided, and that cases of disease dangerous to associated workers may be eliminated.

Let me give you one or two examples. A friend of mine, a physician, employed a lad of 15 years as an errand boy. It was noticed during the past winter that the boy had frequent colds, but seemed otherwise well. By the merest chance it was learned that his mother had been ill for some months, and further enquiry disclosed that she had pulmonary consumption. The boy had a careful examination, and it was discovered that he had a focus of tuberculosis in one of his lungs. He was sent to the Preventorium and has gained 5 lbs. in a couple of weeks. A few months at the Preventorium will put him to rights, when he will be able to return to work. Further delay would probably have meant his early death from consumption. Or again, a man or a woman may have the mucous patches of syphilis in the mouth with or without knowing that he or she has the disease. The common drinking-cup, the use of which is prevalent in many factories, and which should be prohibited by law, is used by such a person. An innocent worker may then use the cup and acquire syphilis. Proper examination of the workers would stop this source of infection, and more, it would give opportunity for the infected person to secure treatment.

Industrial Hygiene Division

Every country should have an active well-organized division of industrial hygiene in its public health department. Such a division should be ready at all times to make a survey of the plants of manufacturing concerns in order to advise the employers regarding health saving devices, matters of first aid, and general sanitation.

A few years ago it was discovered by our district officer of Health that in the steel mills at Steelton the men were drinking from the hose pipe about the mills the ordinary raw water which was highly polluted and in consequence diarrhoea and typhoid fever were common. Men in a red-hot place like a rolling-mill will drink anything that is cold. The subject was taken up with the management, and water-coolers with pure water were installed and the hose-pipes so arranged that it was impossible readily to drink from them. The results were seen in improved health conditions.

Every industrial concern of any magnitude should provide means for first aid for its employees. The arrangements should be simple and not too expensive. I know of establishments which have provided elaborate operating-room equipment. Such is unnecessary. A Division of Industrial Hygiene would be able to give advice in such matters and might even arrange for lectures on general hygiene to the workers at the noon hour or in the evenings. The Provincial Board of Health is making provision for the establishment this year of such a Division which is bound to prove of immense value to the country.

Proper wash-rooms, lunch and cloak-rooms should be provided for employees. I had my attention called the other day to a women's clothing establishment in this city, where a little pen without any door, and 8 feet walls, was provided for a lunch-room, and at the noon hour the shop was swept and the fluff and dust from the shop floated into the lunch-room and over the food. Such conditions should not be allowed.

Women Workers

The most serious matter in connection with industrial work is the increased employment of women. It is serious from the point of view of the normal growth and development of the State. The greatest need of any country is a stable birth-rate and a low rate of mortality among infants. A few countries only show this. New Zealand, Australia, Norway, Sweden and Denmark are notable examples. But women cannot work in factories and raise babies. The mother's undivided attention is the most essential feature in the increasing of the birth-rate and the prevention of infant mortality. Let us consider for a moment the causes of the lowering birth-rate and the increasing infant death-rate. What are the causes? Some say ignorance and poverty. But it can be shown that among the best educated people, and in the midst of prosperity these conditions prevail. There is no country in the world where the system of education is better or the general mass of the people are better educated than in Scotland. Yet the birthrate of Scotland went lower in the last five years than during any former period of the history of that country. The people were earning more money than they ever did, everyone left at home had plenty of work. In spite of this the infant death-rate reached a deplorable figure in that coun. Bradford intry England, a textile centre, literally rolled in wealth during the war, yet the birth-rate sank to about 17 per 1,000 births, and the death-rate under one year rose to 132 or 33 per 1,000 more than that of Ontario. Let us turn to Connaught in Ireland, poor, steeped in ignorance, the people full of nonsense and ready for more; yet despite these conditions, the birth-rate of Connaught rose to 45, and the infant death-rate dropped to 50 and in some places to 35. What was the reason? The mothers stayed at home and nursed the babies and with a little more prosperity

and a little less ignorance all might have lived. I tell you in all seriousness, the mother is the greatest factor in saving the baby, and to do this she must be kept out of industrial work, or in spite of education, in spite of prosperity, in spite of everything else, the future of the state will be imperilled.

The City of Edinburgh, with a reputation as the modern Athens and with graduates of her University leading the medical profession in every part of the Empire, with churches as numerous and powerful as can be found anywhere, should have a better record than she has in the matter of slums and baby saving. The record of Edinburgh in respect to the protection of motherhood is unsurpassed only by that of Paris. There Simpson introduced chloroform much to the scandal of the godly to relieve the pains of childbirth; there Lister proved the value of antiseptic methods in preventing childbed fever; there Ballantyne began the study of ante-natal pathology and therapeutics and founded the first pre-natal bed in any maternity hospital. Yet Edinburgh in a year of unprecedent prosperity had a birth-rate of but 17.9 and during a cool summer an infant mortality of 132 per 1000 births.

Discussion

Mr. Orr, of the T. H. & B. Railway, Hamilton, in discussing Dr. McCullough's paper, brought out the fact that twelve years ago a despatcher on a railroad worked twelve hours each day, under great stress, and that conditions were now improved and a despatcher only worked eight hours. Mr. Orr commented generally on accidents in this country and the Old Country and stated that the G. T. R. had recently issued a statement to the effect that 80 per cent. of all their accidents in the past two years had been preventable.

The chairman asked Mr. Orr whether accidents on railroads were increasing or decreasing.

Mr. Orr replied that accidents were decreasing. In 1919 their company had gone for one week without an accident, and had a period of three weeks in 1920 in which there was no accident.

In discussing Dr. McCullough's paper, Professorr J. J. R. Macleod said:

"Dr. McCullough's paper has been of great interest to me, and I especially welcome his expression of hope that the Department of Health would establish a division of industrial hygiene. In this connection I am very glad to have this opportunity of telling you what the Dominion Government has already done in the way of assisting the development of industrial hygiene. The whole matter came very much to the fore during the war, and last summer the Honorary Advisory Council for Scientific and Industrial Research decided that it was the duty of the Government

to take steps to facilitate the progress of industrial hygiene in Canada. Accordingly the Committee of Industrial Fatigue, of which I am chairman, was formed. The committee includes Dr. A. B. Macallum of the Honorary Advisory Council whom you know, a representative of the Department of Labour at Ottawa, a representative of industry, and members of the departments of physiology of the various Canadian Universities.

"The functions of the committee are purely advisory and investigatory. Its general purpose is to bring industry and medical science into closer touch, so that the firms may benefit by a proper control of the health conditions of the workers. In order to promote this the committee has adopted three main measures. In the first place, it offers industry the help of scientific laboratories in solving health problems which arise in industry. In the second, it offers industry the use of a bureau where the most up-to-date information on every sort of health danger and on the corresponding preventive or palliative measures is kept. In the third, it is ready to co-operate with any member of industry in conducting surveys or investigations into such questions as sickness incidence, cause of lost time, etc., both in individual plants and in individual industries.

"I can safely say that the Government is concerned in all problems of industrial hygiene and is ready, both in the interests of increased production and in the interests of increased industrial health—the two things are inseparable—to do all in its power to promote healthy conditions in industry. The committee thinks that it can help manufacturers to save money—to put it crudely—by helping them to safeguard the health of their employees.

"Coming to practical details, the procedure would be somewhat on the following lines: a manufacturer in some industry where he recognizes or suspects harmful effects on the health of the workers would apply to us to know if the hazard was due to some avoidable cause, or, if not, what the best preventive measures were. We would have to inspect the problem to see if it was a feasible one for us to undertake. Then, if it were, the expenses of any further investigation which might be necessary, and which we would conduct in collaboration with the business management, would be borne in part by the manufacturer and in part by the Government, who, as I said, are vitally interested in the solution of such problems. Again, it might be that full knowledge of the solutions proved by the experience of other manufacturers in the same industry would render a special investigation unnecessary. In this case the committee would furnish an account of this reported work which the manufacturer could then apply. It is precisely for this purpose that we have established the bureau of which I spoke, where such information is at hand and will be kept up to date.

"I think I have explained our objects and it only remains to say, both to the firms represented here and through them to others, that if there is any problem in which they think we might be of assistance I hope they will let us know."

Miss Hutton, Secretary to the Committee on Industrial Fatigue, said:

"There is nothing further for me to say except to give the address of the Toronto office of the Committee on Industrial Fatigue and to tell you that as secretary, I shall be very glad to receive any questions or requests for information. The office is in the Medical Building of the University of Toronto and correspondence should be addressed to Miss R. M. Hutton. This office is the bureau of which Dr. Macleod spoke. I think we can say with confidence that we have up-to-date information on all aspects of industrial hygiene and have a great deal of material which should be of use to plant physicians, sanitary engineers, service and safety men and, indeed, to anyone who wants facts bearing on industrial health. For instance, to take one very common hazard, that of lead poisoning, we have information on its incidence, on the measures by which in certain plants it has been completely eliminated, on the best palliative measures in other plants, on the personal precautions in which all workmen should be educated, and on the medical treatment after poisoning has occurred. Or again, many trades have hazards of dust or fume inhalation. In these cases we could supply information as to the most convenient kind of gas mask, the best exhaust system or the most efficient type of hood. I have only instanced two hazards and have selected them at random. My object is simply to show that we aim at being a clearing house for reliable information on practical matters."

Mr. Wanzer, of The Steel Company of Canada, asked for information regarding protectors for coal dust and gases. He stated they were at present using protectors such as rubber mouthpieces, but that the men objected to them, claiming they were unsatisfactory. He stated that men working in the vicinity of tank cars and furnaces often have been taken to the first-aid room as they were suffering from the effects of gas. The present gas mask is cumbersome and heavy, and they are now looking for a simple and practical protector for the men.

Dr. Macleod replied that the gas and general conditions require investigation. He stated that in the case of coal dust the proper masks and ventilators would materially reduce hazards and offered to help his committee in the solution of this problem.

Mr. Falk, of The Henry L. Doherty Company, stated that in their natural gas operations they were using a mask known as the Improved Gasco Protector, and found this reasonably satisfactory. He informed the meeting that a new mask was being put on the market by the Draeger Company.

Accident Prevention in the Automobile Industry.

By Frederick H. Moody,

McLaughlin Motor Car Co., Ltd., Oshawa

Read before the Annual Meeting of the Ontario Safety League, Toronto, April 13th, 14th, and 15th.

BEFORE a meeting such as this, it would be a waste of time to enter into any lengthy explanation of the advantages accruing both to the company and to the individual employee, through a proper appreciation of safeguards throughout a plant. Their value, when applied rationally, cannot be overestimated. It is only when the subject is handled by a super-enthusiast, if I may use such a term, that the full effectiveness of safety engineering is sometimes injured. By that, I mean the case where the applications of safety measures would possibly encumber the machine, or the movements of the operator, so as to diminish production to such a degree as to more than offset the value of the protection thereby obtained. The subject must be approached rationally, never losing sight of the present day slogan of "Increased Production."

The automobile industry probably does not involve problems that are essentially different from those that prevail in any metal or wood working factories, as the processes that prevail are primarily the same as those found wherever wood and steel are worked. It may safely be said however, that there are few industries that employ such a wide range of machinery, as nearly every other trade is tributary to it in some degree in the supplying of its myriad wants. But this is considerably narrowed down in factories where the factory is actually built, by the fact that, there being so many parts more or less common to many makes of cars, numerous specialty firms have sprung into existence to supply these wants. This factor also helps the safety movements, as I think you will agree, that generally speaking, it is more feasible to manufacture one product under more ideal conditions, than if a wide range of quite dissimilar parts were made with the same equipment. The automobile plant is becoming more and more a group of specialty shops; that is to say, as automobile production is increasing, the practicability of having a quite separate department or plant, for each part of the car, is increasing. This, as previously pointed out, all tends towards safer conditions.

In the Oshawa plants of the General Motors Company of Canada, Limited, of which the McLaughlin Motor Car Company, Limited, is a subsidiary, there has been no concerted plan of accident prevention, although the movement has for years received every encouragement from the management. By this, I mean that while there is no safety engineer, safety committee, etc., the management, superintendents, foremen, etc., have shown so much interest in the matter individually, that the shops and machines are as fully protected as we think a good practice dictates.

A few instances of the protective measures in use will be cited. Every elevator in the plant, of which there are a number for moving cars, chasses and bodies between floors, has automatic rising gates at each floor, controlled by the movement of the elevator, remaining closed except when the elevator is in the immediate vicinity of each floor. These elevators are of the open type, and to prevent articles falling through the bars of the gates on the occupants a strip of heavy wire mesh is placed over each end of the elevator. The elevator shafts are also protected at night by heavy fire doors, as are also the openings between the various buildings; but this, of course, is required by the insurance underwriters.

The yard of the McLaughlin plant is L-shaped, and as there is a lot of traffic, of incoming express, and cars going out and in in the process of being loaded, the gate is made double, with an "in" and "out" opening. As the approach views are somewhat restricted this is a potent factor in preventing accidents.

You are all aware of the difficulty of coping with the tendency of men to hurry out, precipitately on the first sound of the quitting whistle. The consequent hustle makes it not overly safe for the peaceable person to be in the path of the departing employees, so the management permit the women employees to leave five minutes before the men, thereby avoiding the mad rush.

Special pains have been taken to thoroughly protect every belt, especially all those that come less than four feet from the ground. No standard types of guards have been adopted, but they all seem quite effective. The more prevalent type is that made up of four wooden posts, with wooden cross slats, rising to about six feet from the ground. Other types are made of heavy wire mesh, pipe, etc., more or less along the conventional lines. Also wherever a motor drive belt passes overhead the lower belt is encased in a trough.

Protective Devices in Wood Shop

The wood shop presents more field for protective devices than most of our shops, but the big difficulty experienced there is with the employees

not appreciating their value. Several devices have been developed and where used have proved effective. On the shaper we have a useful guard with both horizontal and vertical adjustments, which has the additional advantage of acting as a guide for flat work. The Jones guard is used on the jointer. The circular saws and planers both have guards of the overhanging type. The gainers are protected by a pan hanging on the operator's side, which prevents the table travelling too far should the operator trip over the machine. The usual hinged wire mesh guard protects the band saw, with the added feature of moveable guards for protecting the saw below the mesh guard. The shapers and gainers are used principally with special formed jigs, as most of the work in the automobile industry is productive. Much in the way of protection can be developed in the proper design of these jigs, and satisfactory results are being secured considering that these two types of machines are deemed the most dangerous in the wood shop. The immediate neighbourhood of these two machines is also rendered dangerous by the chips which they cut or tear off. For the larger machines special movable wire mesh screens are set on the floor around the machine, and nearby windows covered with mesh on account of possible broken glass. The smaller machines have fixed protection of the same type, as well as the suction system with which all machines are equipped. For certain types of work special adjustable ball jointed pipes are led right to the cutting head.

The suction system, as a means of purifying the air and carrying off dust, may well be counted as one of the best known safety measures and is in use in several places throughout our factories. Every polishing lathe in the plating shop has a suction pipe for each wheel, keeping the air so clear that the electric baths in the same room are not affected by the metal dust. Our numerous spray painting booths are all equipped with a fan so that each may be controlled individually. These booths are all of the same general cone shape, with the suction outlet at the inner end, the operator standing at the open end, entirely clear of all paint spray, which is effectively removed by the fans. The larger booths for body and chassis spraying, have two larger openings, while the wheel spray are quite small. In the engine block test room, a similar vacuum system draws off all the exhaust gases, each engine having a flexible connection to the overhead trunk line. A vacuum system is also employed for purifying the air of one of our final test rooms. Fumes from the dripping vats are drawn off in the same manner.

The sheet metal shop, machine shop, assembly room, mounting room, and other shops, are all equipped with a certain number of safety devices wherever the need for such devices has become apparent. But the big difficulty in the way of protective devices is not the question of devising

such a device, but the convincing of the operators that it is distinctly to their advantage to make use of them. A persistent educational campaign is required to bring this about, and in this direction we are now trying to move ahead.

First Aid Equipment

First aid forms an important part of the protective work, and in this our company has made good progress. We have a well-equipped first aid room, with other first aid points throughout the plant, all supervised by qualified first aid men.

I have here some of the literature which we are using in this educational campaign. The placards are posted throughout the factories, in conspicuous places where all who run may read, but the circulars are only placed in the hands of the foremen, who are supposed to impart the information to their men. The management are also securing a quantity of enamelled signs to be put up in the factories carrying such cautions as: "Think. If safe, go ahead;" "You can't afford to take a chance;" "Ring bell before starting elevator;" "Report unsafe places at once to your foreman;" and "Do not wear loose or torn clothing."

The safety movement is also aided by our weekly paper, "Motor Sparks," in which timely suggestions are offered.

All this literature is valuable in bringing before the men continuously the value of safety measures. But the real impetus to this movement from an educational viewpoint is the proper supervision of the work. It is in this that we believe our greatest progress is being made, our various heads, from the foreman up, interesting themselves in the movement. The men are encouraged by this means, and where great presence of mind is displayed in the prevention of some serious smash up, our president has been known to reward the men very tangibly.

Dangerous conditions often arise from the most unexpected quarters. For instance, oil and paint soaked waste in the paint shop has been the cause of more than one incipient fire from spontaneous combustion. The education of the men to collect this waste into proper receptacles, at regular intervals, for removal, is part of the safety movement. Dipping articles in the japan vats at too low a temperature has also caused subsequent fires in the ovens. Correct and intelligent supervision is overcoming all this.

Some of the plants in the United States have had safety movement with them for a long time. But it was not until November last that definite steps were taken to perfect a plan of central organization for the promotion of safety work throughout the various divisions of The General Motors Corporation. This inaugural meeting was held during

the session of the National Safety Congress in Cleveland. The degree of interest evinced by the G.M.C. may be noted by their having 16 delegates in attendance.

Central Safety Committee

The educational and publicity work of this centralized movement for the divisions of the General Motors Corporation is conducted by O. S. McQuistion, Inc., of Detroit, and the recommended plan of organization is as follows:

Appointment of a Central Safety Committee from among the managers and superintendents, the number of this committee depending upon the size of the plant. The Safety Engineer will report to this committee.

Direction

(*a*) Plant supervision by managers and superintendents. (Central Safety Committee.)

(*b*) Safety Engineer.

Education

(*a*) Bulletins.

(*b*) Pamphlets.

(*c*) Pictures:—Local—Plant; Motion Safety; Entertainment and Instruction, and slides Safety Instruction.

(*d*) Lectures—Short snappy talks, usually four minutes.

(*e*) Statistics—Accident; Canadian Labour; Foreign Labour, and other Industries.

Inspection

(*a*) Unsafe Conditions—Machinery; Transmission; Building and Property; and Sanitation.

(*b*) Safe Guarding—Physical Guards; Safe Practices; Improved Method and Influences.

(*c*) Good Housekeeping—System; Direction; Co-operation and Interest.

The above outline covers practically all phases of safety work and accident prevention.

The Central Safety Committee will appoint from among its members a committee on Education, whose duty shall be the supervision of all bulletins, pamphlets, pictures and lectures; a committee on inspection for the purpose of a careful supervision of unsafe conditions, safe guarding and good housekeeping, and a committee on statistical information

for the purpose of statistical knowledge of accidents and all other statistical information that has any bearing on accident prevention. All these committees in turn shall report their findings to the Central Safety Committee who will make a final decision. A shop committee, including the foremen, should be selected for the purpose of plant safety supervision. The point is to get all working on accident prevention.

A great deal rests with the Safety Engineer, who must be a safety man through and through; one capable of acting on all phases of the work; a live wire; a good mixer; one who can get to the superintendents; a man capable of promoting clear constructive thinking and a wholesome co-operation in every department of the plant; he must be an all around man.

Some of the duties of a Safety Engineer are as follows:

Each morning go over the accident report of the previous day and find a remedy to eliminate a repetition of preventable accidents, and make, if possible, a sketch of the machine, or place where the accident happened. Supervise the inspection of every machine in the shop each day and see that all safeguards are placed in good condition. Supervise the inspection of tools and equipment and report immediately on any defect found. See that the material on the floor is placed in safe order and not piled in a dangerous way. See that the floor is clean and in good condition—central passage clear. Make a daily inspection of drinking fountains, cuspidors and water closets, and see that they are kept clean and in good condition. See that the factory is well ventilated and all smoke and gases carried off. Give every injured man a pass for treatment. Note all near accidents. Supervision and direction of all monthly accident reports and all such other duties as pertain to the plant.

Four Accident Prevention Essentials

There are considered four essentials in accident prevention:

First—The manager, who must be won over to the necessity of accident prevention. The big essential is to have the manager back of all safety movements.

Second—The foreman, the next man, must also line up. As you know our first activities along accident prevention were devoted to safeguarding—the covering up of exposed gears and fly wheels; guarding of dangerous places, etc. All of this has only cut our accidents one-third so that now it remains a process of education, and the biggest man looming up in this education propaganda that must be put forth is the foreman. Care for the new man and protect all.

Third—The employee, who comes next, is the fellow we must get our message to. This must come through education. Have him see the necessity of wearing leggings in the foundry; goggles when grinding; the use of lifebelts, etc.

Fourth—The family is another avenue we may use to get our messages across. We can do this through the school and safety drives. Children learn safety easier than grown-ups. This is one of our best opportunities to teach accident prevention. Safety drives get people talking and thinking about safety and it must do some good. Accident prevention is worth while; it ranks with any movement ever started for the benefit of mankind.

Accident prevention is still in its infancy and our reward in the future shall be the number of lives we may save; the number of limbs kept on the bodies; the number of eyes that will continue to see, and the real happiness that the home may show where carelessness has not entered.

The foregoing resume shows what our parent, the General Motors Corporation, plans to do in the safety field, and this work will reach out to every division.

Shop Lighting.

By Kenneth A. McIntyre,
Electrical Engineer, Toronto

Read before the Annual Meeting of the Ontario Safety League, Toronto, April 13th, 14th, 15th.

MANY attempts have been made to determine the percentage of industrial accidents attributed to improper illumination. The estimates range from 23 per cent. upwards, and cannot be taken unqualifiedly, inasmuch as it seems impossible to secure an accurate classification of this kind. Poor illumination is certainly directly responsible for a considerable percentage of such accidents and indirectly responsible to an even greater extent. This general statement is borne out by the results of the study of an insurance company's accident statistics for one year. The number of fatal accidents in the months of December and January proved to be 40 per cent. more than might reasonably be expected were there the same number of daylight hours in winter as in summer.

Under poor and improper lighting an obstacle in the workman's path means tripping or falling with possibility of becoming caught in machinery. Ever since stairs have been invented human beings have been prone to fall up or down, and poor illumination favours the habit even though a broken limb or a broken neck be the penalty. Presence of shadows is also blameworthy.

Accidents are caused indirectly by injurious effect of improper illumination on the eyes, resulting in impaired visual powers.

Further, for humanitarian reasons, the eyesight of employees should be conserved.

The Postal Life Insurance Co., in its Health Bulletin No. 22 in 1918, states: "The visual faculty is life's most precious boon, yet from infancy to old age its wealth is squandered in ignorant and excessive use. Among the agencies that work injury to the eyes it is probable that our system of artificial lighting is the most destructive. The illumination in our homes offices stores, and factories is nearly always direct, concentrated and intense; whereas the most elementary science and knowledge of the laws of refraction teach that it should be indirect, diffused, and at least as mild as daylight. But a vastly greater number of victims of defective lighting systems are those whose vision has become gradually impaired through an unconscious effort to accommodate the eye to the glare of an electric bulb in its immediate vicinity. This growing weakness in the seeing power means reduced efficiency in every way."

Eye-strain is productive not only of headaches but of specific disorders of the system, as well as resulting in actual diseases of the eye, with blindness frequently the consequence.

The real test of illumination is the ability of the eye not only to discern details distinctly, but to continue the visual effort for a great length of time without eye-strain and fatigue.

Good Lighting Stimulates Production

Factory output or production is stimulated and improved by good illumination in various ways:

1. Increase production for same cost.
2. Greater accuracy in workmanship with consequent reduction of spoilage.
3. Reduced accident hazard.
4. Avoidance or at least reduction in eye strain.
5. Surroundings made more cheerful.
6. Work performed with less fatigue.
7. Order neatness and sanitation promoted.
8. Superintendence rendered more effective.

Such advantages are obvious and can be obtained through an annual expenditure of less than 1 per cent. of the pay roll. It is not difficult to realize many times over on the investment.

During the past few years perfectly good machinery has been scrapped without hesitation to make way for more efficient machinery in the endeavour to increase production and reduce its unit cost. We should not overlook the need of the man in charge of the machinery and to provide him with the very best working conditions. He is the vital factor.

Lighting is of two kinds, natural and artificial. The requirements for good lighting under both classes are much the same.

1. Sufficiency under all conditions.
2. Diffusion, *i.e.*—the avoidance of glare and of extreme contrasts of light and shadow.
3. Maintenance to ensure the conditions contemplated in the proper designs.

As the architect or engineer, who is abreast of times, gives, during the design of industrial structures, very careful consideration to the matter of natural lighting, before passing to the subject of artificial lighting, the following points on natural lighting are worthy of mention:

1. Where no overtime operation is in effect 65 to 75 per cent. of the work is done by natural light.
2. Lighting codes require double intensity of natural lighting over artificial lighting because light coming to the eye in daylight from all the

surroundings is much brighter than at night. Thus a more intense light is required on the work.

3. Light should be adequate for each employee.

4. Windows should be so spaced and located that daylight conditions are fairly uniform over the working area.

5. Intensitites of daylight should be such that artificial light will be required only during these portions of the day when it would naturally be considered necessary.

6. Quality of light should avoid glare due to sun's rays or light from the sky shining directly into the eye. Window shades or awnings should be provided where necessary to this end.

7. Ceilings and upper portions of walls should be maintained a light colour to increase effectiveness of lighting.

8. Among the special means of improving natural lighting may be mentioned saw-tooth roof construction, skylights, and the use of prismatic glass to redirect light into the working space.

9. Wire glass should be used as safeguard where there is danger of glass falling if broken.

10. Some factory laws require the use of clear glass in lower sections of windows as enable employees to exercise long range vision to retain that power.

11. Windows should be cleaned regularly at proper intervals.

We now come to the subject of artificial illumination. Its importance has kept pace with the growth of modern industry, but its proper consideration is only too generally neglected, yet 25 per cent. to 35 per cent. of work is performed under artificial light. Production often demands more than one working shift and even where this is not the case, adequate illumination must be continuous regardless of length or brightness of days. Because of limited time electric lighting only will be discussed.

At the outset it is well to realize that the incandescent lamp in its present stage of development is many times more efficient than the lamps of ten or fifteen years ago; it is available in larger units and at reasonable prices. Its brilliancy has also greatly increased, which introduces a serious problem.

Artificial lighting must comply with the requirements for good illumination set forth earlier in this paper. Complete satisfaction cannot be obtained if one of them is neglected.

In considering illumination measurements are made in units of intensity of illumination such as distances in feet or weight by pounds. The unit of intensity is known as the foot-candle and is the intensity of illumination produced on a surface one foot distance from a lamp of one candle power.

Measurements are made by means of an instrument called a photometer. A simplified form known as the "Foot-candle meter" is in general use and is sufficiently accurate for practical purposes.

The first requirement is sufficiency. Intensity will be determined largely by the colour and fineness of the materials in process of manufacture. Since an object is seen only by the light it reflects, dark objects will require higher intensities as does also work requiring more accuracy.

The intensities must be sufficient whether working surfaces are in horizontal, oblique or vertical planes.

For an average value intensities in a vertical plane will be approximately one-half those in a horizontal plane of the same installation.

Diffusion, the second requirement, avoids glare, which is defined as "Brightness within the field of view of such excessive character as to cause discomfort, annoyance or interference with vision. An exaggerated and familiar example of glare and its effects is met at night in attempting to drive on a highway under the spell of unprotected headlights approaching.

In problems of illumination the degree of glare depends upon six principal factors:

1. Total candlepower emitted by the source in the direction of the eye.
2. Distance from the source to the eye.
3. Intrinsic brilliancy of the source.
4. Contrast in brightness between the light source and the working surfaces and surroundings.
5. Proximity of the light source to the line of vision.
6. Length of time during which the source of glare is present within the field of vision.

Another form of glare is so-called specular reflection, in which case the image of a bright light source is reflected from a highly polished surface. This is especially trying because it is necessary to keep the eyes directed towards such surfaces when working on them and the eyes by nature are much more sensitive to light rays entering from below.

The avoidance of extreme contrasts require the illumination of surrounding surfaces as well. Thus the eye is not called upon constantly to change its adjustment from one extreme to the other. Aisles and passages for this reason must be well lighted.

The foregoing considerations lead to one conclusion—general lighting from overhead. It is thus possible to keep the light source somewhat above the line of vision and to secure uniform distribution by choice of proper reflectors correctly located as to mounting heights and spacing.

The use of drop lights should be avoided except when absolutely necessary because of very fine character of work or shadows cast by parts of machinery. The lamps should be covered from view by suitable reflectors.

Incandescent lamps are available in sizes 10 watt to 60 watt in vacuum type and 50 watt to 1,000 watt in gas filled type for choice to meet any conditions. Their average life is 1,000 hours of burning and at the end of that period their efficiency is within 6 per cent. of initial value.

Voltage fluctuations, if frequent and considerable, have a bad effect. Low voltage decreases candle power, over-voltage shortens lamp life. The lamp should be selected for the average voltage of the circuit. Light and power circuits should be kept separate if possible to minimize fluctuations of voltage. Copper sizes in wiring should be sufficient to keep voltage drop within 2 per cent.

Light emitted from incandescent lamps contains the colours of daylight and is not unpleasing to the eye. A type is available which approaches the colour value of daylight.

The effect of frequency in the use of alternating current for lighting has been a matter of investigation in order to detremine the critical frequency below which it is unsafe to go, but it is difficult to define what constitutes objectionable flicker. Incandescent lamps are least sensitive to low frequencies so far as flicker is concerned. For Physical reasons the smaller sizes up to 25 watts show a perceptible flicker on 25 cycle circuits, though in larger units the flicker is not evident. Much of the annoyance displayed by some people must be due to suggestion and imagination. The case is cited of the man who worked for months under 25 cycle lighting without knowing it. Upon having the flicker called to his attention, he suddenly developed headaches and eye-strain. Flicker can seldom be observed by looking directly at the light source or at the plans of illumination. Due to the fact that the periphery of the retina is more sensitive to flicker than the centre, flicker can be detected out of the corner of the eye by looking directly at an object to one side of the light source. In general, it may be stated that for factory lighting no difficulty will be encountered except for very fine work under small size lamps for local lighting.

Three methods of general lighting are available, direct, semi-indirect, and total indirect. The two latter are more suitable for illumination of offices, stores and buildings other than factories. Being inverted, they accumulate dust under average factory conditions unless cleaned very frequently.

Since an unshaded lamp sends no more than half its light below the horizontal, it is necessary to make use of reflectors.

In considering reflectors for a direct lighting system, the size of lamps must be first decided according to intensity required, spacing and mounting heights, which factors are determined by dimensions and structure of the building.

Reflectors may be divided into the broad classes:

Extensive
Intensive
Focusing.

The former being used for moderate heights of mounting and the latter for greater mounting heights. In a brief article, time does not suffice for sufficient detail of illumination design and the statements are therefore more or less in the form of an outline.

Reflectors may be obtained in these three styles, but made of various materials, a list of which with comments follows:

Porcelain Enamelled Steel are strong, durable, reasonably efficient, reflecting surface does not deteriorate and can be easily cleaned, restoring to original condition.

Paint Enamelled Steel should only be used for temporary work since they are usually of light guage metal and surface deteriorates rapidly. Cleaning cannot altogether restore the surface to original condition.

Aluminized Steel has almost gone out of use in favour of porcelain enamelled steel. Strong, but the surface when dirty can only be restored by refinishing.

Mirrored Glass are breakable and require careful handling. Makes are available which show maximum efficiency over all other types of reflectors, the reflecting surfaces of which do not depreciate. Are opaque.

Prismatic Glass are breakable and require careful handling. Designs are available which give excellent results and have the added advantage of permitting light to pleasantly illuminate the ceiling and other upper surfaces. The makers claim low depreciation due to dust accumulating because the refracting and reflecting prismatic surfaces are not affected.

Opal Glass reflectors are not so efficient as prismatic glass, but the same remarks apply. They give excellent diffusion.

An interesting development is a combination steel and glass reflector recently designed which permits a portion of the light to escape to the upper parts of a room.

It is important in using low mounting heights to either use bowl frosted lamps, or to supply diffusing or reflecting caps over the tip of the lamps to hide the bright filament from view.

Lighting systems should be conveniently controlled by switches either local or in sectional cabinets. Circuits should run longitudinally so that central spaces can be lighted first as twilight approaches.

It is important to provide emergency from a separate source if possible so that in case of failure of the main lighting and power system employees in emergency are able to find exit.

Watchman's circuits should be provided giving just sufficient light for safe vision in walking and to detect intruders.

Yard lighting should not be overlooked in the interest of safety. The need for stair and passageway lighting has already been mentioned.

Last, but not least, is the requirement of maintenance to ensure good lighting. According to a recent and comprehensive articles the best practical method involves:

1. The use of a depreciation factor, or factor of safety in the original design of the system to ensure adequate illumination when the system has depreciated a normal amount.
2. The cleaning of lighting units at frequent, regular intervals.
3. The replacement of lamps which have become blackened in service by abnormally long life.
4. The use of lamps at correct voltage rating for all replacements.
5. The refinishing of ceilings and walls at reasonable intervals.

This method should not stop with a knowledge of and a desire for it, but it should be organized as a regular part of the shop routine. Tests show that after a period of neglect illumination can be increased anywhere from 25 per cent. to 100 per cent. by merely washing the units.

Lamps in use below rated voltage will show for each five volts below rated voltage a decrease in candlepower as follows:

5 volts—15 per cent. loss.
10 volts—29 per cent. loss.
15 volts—41 per cent. loss.

so this point is one we can ill afford to pass by.

The great need for education on the subject of factory illumination is forcibly illustrated by data recently gathered in 446 industrial plants by trained observers. 85 per cent. of the manufacturers interviewed were more or less satisfied with their present lighting conditions, and yet only 40 per cent. of the plants visited were adequately lighted. Better illumination was needed in 60 per cent. of them.

The intelligence of men interviewed on the subject was rated as:

Intelligently informed 44.5 per cent.
Vaguely informed 36.4 per cent.
Not informed 20.1 per cent.

A further astonishing disclosure shows that there were more plants burning bare lamps than there were plants with lamps entirely equipped with reflectors. Here is the call to safety organizations for an educational campaign for the benefit of employees' welfare and safety.

The educational efforts of the Illuminating Engineering Society and of safety organizations have already resulted in legislation in several states in the United States.

The lighting codes thus made law are a logical step to follow in the path of industrial legislation. The requirements set forth in them are designed to protect the operators who must work for long hours under the conditions day after day. They are the very minimum consistent with consideration of the workers' health. They do not, however, ensure the most economical production, for which result much higher intensities are necessary.

These codes are in force in California, Pennsylvania, New Jersey, New York, Ohio and Wisconsin. A partial table of the Wisconsin requirements for intensities is given herewith:

EXTRACTS FROM WISCONSIN LIGHTING CODE

Order 2112—Artificial Light.

When the natural light is less than twice the minimum permissible intensities of illumination set forth in the following table, artificial light shall be supplied and maintained in accordance with the table. The intensities of recommended practice indicate the desirable illumination for best working conditions.

ILLUMINATION INTENSITY AT THE WORK IN FOOT CANDLES

	Minimum Permissible Intensity	Ordinary Practice
(*a*) Roadways and yard thoroughfares	0.02	0.05—0.25
(*b*) Storage spaces	0.25	0.5 —1.0
(*c*) Stairway, passageways, aisles	0.25	0.75—2.0
(*d*) Toilets and Washrooms	0.5	1.5 —3.0
(*e*) Rough manufacturing, such as rough machining, assembling, rough bench work, foundry floor work	1.25	2.0 —4.0
(*f*) Rough manufacturing, involving closer discrimination of detail	2.0	3.0 —6.0
(*g*) Fine manufacturing, such as fine lathe work, pattern and tool-making, light coloured textiles.	3.0	4.0 —8.0
(*h*) Special cases of fine work, such as watchmaking, engraving, drafting dark coloured textiles	5.0	10.0—15.0
(*i*) Office work, such as accounting, typewriting, etc.	3.0	4.0 —8.0

Note:—The measurements of illumination are to be made at the work with a properly standardized portable photometer.

The minimum foot candles specify the lowest illumination intensity with which the employees can be expected to work with safety when artificial light is used. It is to the advantage of the employer to provide the intensities of the ordinary practice, as this results in less eye strain, greater accuracy of workmanship, increased production for the same labour costs and less spoilage. When part daylight and part artificial

illumination is used it is desirable to use even higher intensities than those of ordinary practice in the table above. (See note accompanying Order 2111.)

In order that the illumination intensities shall never fall below the minimum during the interval between inspections installations should be designed to produce initial values at least 25 per cent. higher.

Note that measurements are taken at the work regardless of its position whether in a horizontal, oblique or vertical plane.

In conclusion it should be realized that the science of illumination has made tremendous strides in the past few years. The installation of more than five years which has not been properly revamped during that period is now obsolete. The design of a modern efficient and satisfactory system of lighting is no hit and miss proposition but requires the services and best thought of an expert.

Surely in all the provinces of Canada to-day there is the most glaring need for education and legislation to abolish the evils of harmful illumination and to bring to the aid of Canadian industry in its forward march the powerful ally of good shop lighting.

Discussion

In discussing Mr. McIntyre's paper Mr. H. L. Sheen, Canadian General Electric Co., Limited, Toronto, said:

Mr. McIntyre's very excellent paper on "Shop Lighting" is in accord with the latest recommendations of the Illuminating Engineering Society embodied in the lighting codes now in force in seven states in the United States.

The whole problem in a nut shell is summarized by the words, "Sufficient light properly diffused" and the advantages as far as health and safety are concerned:

Reduction of Accidents.

Better working and living conditions.

Greater contentment of employees.

Order, cleanliness and neatness in the plant.

Easier supervision.

Advantages with regard to production include greater accuracy in workmanship, decreased spoilage of production and increased production for the same labour cost.

Considerable assistance can be given to factory managers who have not the time to go into tenchicalities on lighting by making up recommendations on a watts per square foot basis. A very useful table for connecting foot candle illumination with watts per square foot for certain standard equipments is now available.

So thoroughly convinced are all who have made a study of lighting that adequate illumination is an important factor in accident prevention that the codes above referred to are now published. I understand that no attempt has been made to enforce the law until now, but the inspectors will begin right away a systematized inspection of industrial plants, following this inspection with proper recommendations for illumination. I am sure that Mr. McIntyre will agree with me that such legislative action would be most advisable in Ontario, and in fact in all of the provinces of Canada.

Mr. Martin: How is a man to judge the correct voltage to use at home. He may be using a stronger voltage on some circuits than on others and an electric stove will affect the other parts of the house.

Mr. McIntyre: As the voltage is different for the different centres in Ontario you should ask the city department what the voltage is, and then use accordingly.

Mr. Wanzer: Why do the factories use beaded or frosted glass for the lower section of the windows? Is it because the men may become distracted from their work or is it because of the light?

Mr. McIntyre: This point was covered in my paper. In the United States the lower part of the window must be of clear glass so that the workmen may exercise their powers of long vision, as they may become very short-sighted from close application to work.

Mr. Hawkins: Is it possible in case of an emergency to influence the rival firm to give you service? They would be able to carry a load large enough to make it worth. Would the Ontario Safety League have any influence in this connection?

Mr. Martin: Perhaps you could install a small storage system to take care of this.

Mr. Hawkins: This would run up into several thousands.

Mr. Little: It comes to my mind while on the subject of installation, a demonstration of a double reflector for fine machine work, where the operator wants a strong light on his work. Usually while there is a bright light on the tool or lathe the worker who, apart from that, is in a very dark situation. This new reflector is a double one, the outer shade is green and the inner one is painted white, thus assuring a soft lateral light on the eyes. From these a strong light is thrown on the work and soft one on the eyes.

Mr. McIntyre: This is a very good point.

The chairman then called on Mr. Wills Maclachlan for his paper on and demonstration of "Resuscitation."

A Plan for a More Effective Federal and State Health Administration

FREDERICK L. HOFFMAN, LL.D.
Third Vice-President and Statistician the Prudential Insurance Company of America

(*Continued from the May issue*).

Misleading Sickness Statistics

The ascertainment of the true rate of sickness in a given community or in a selected group of persons is a much more difficult task than the determination of the approximate death rate. Death is a strictly definable term whereas the terminology of disease defies precise analysis.* Earlier inquiries into the subject of disease prevalence bear in some respects evidence of greater intrinsic merit than more recent efforts in this field of statistical research. Regardless of decidedly better opportunities for statistical and medical investigation, the same conclusion applies to sanitary surveys, which only too frequently are made without the required qualified knowledge of the underlying technical principles and the most accurate methods of statistical inquiry. There has, for

*There is much need of a more adequate and strictly scientific treatment of the subject of death and the duration of life, physiologically considered. Among the more important discussions are the chapter on death by James Ritchie, in the treatise on "General Pathology", by Pembrey and Ritchie, and a brief discussion by Adami in the text-book of pathology by Adami and McCrae. The discussion of death and particularly of the lesions leading to sudden death, as determined by post-mortem, in the text-book of pathology by Delafield and Prudden, is of exceptional value. The subject, of courset has quite a literature, which has been admirably summarized in an article on "Death" with special reference to physiological variations, by W. H. Howell, including a long lis, of references, in the Reference Hand Book of the Medical Sciences, vol. iii, 3d edit., New York, 1914. To those who are concerned with the so-called "Causes of Death" the recently published work on "Causation", with a chapter on belief, by Charles A. Mercier, M.D., London, 1916, will prove of the very greatest value. This work includes an extended discussion of the so-called "causes of death" on the basis of a well-reasoned theory of causation opposed to the doctrines of John Stuart Mill. See also in this connection two exceptionally valuable articles on "The Causes of Diseases", by Ernest S. Reynals, M.D., reprinted in the *Scientific American Supplement* for February 16th and February 23rd, 1918. Of additional value is the treatise on "The Origin of Disease", especially of disease resulting from intrinsic as opposed to extrinsic causes, by Arthur V. Meigs, Philadelphia, 1897, and the earlier work on the "Causation of Disease", with an exposition of the ultimate factors which induce it, by Harry Campbell, London, 1889. In these and many related matters only a thoroughly equipped research department, can render the exacting scientific aid required, if results of far-reaching value are to be forthcoming. Such research may extend over many years and the results for a long time may be both costly and disappointing.

illustration, been no more comprehensive investigation into the sanitary conditions of the City of New York than the report made by the Council of Hygiene in 1865. By way of contrast the so-called "Sickness Census" of the Framingham Community Health and Tuberculosis Demonstration is an excellent illustration of the serious shortcomings of present-day superficial methods of inquiry. Thus, for illustration, it is said in this report that "It is interesting to note that the number of individuals per family recorded in the census (4.52) is a higher rate than the average for the community at large as based on the 1915 census (4.49)". There, of course, is nothing interesting or suggestive in a differential percentage which disappears if the figures are reduced to the first decimal; yet the conclusion is drawn from a difference of only 0.03 per cent. that this "is probably due to the fact that the census covered a higher percentage of adjacent urban population than of pseudo-surburban village and rural population". The pretense of knowledge implied in this assertion is as regrettable as the obviously erroneous conclusion itself.

In the same investigation the terms "health census" and "sickness census" are used interchangeably, although, of course, neither one is precisely the equivalent of the other. The "census" itself is made to include diseases as such as well as conditions contributory thereto, or resulting therefrom. The term "disease" is not defined, but the request in the house to house inquiry for information was for either the disease *or the cause* of sickness. Clearly upon such crude assumptions no satisfactory medical, social and economic results can possibly be secured. By combining all diseases and conditions, the group defined as "sick" is made to include such cases as "run down", "nervousness", "cold", and "old age". The analysis is not by sex, so the correct incidencc in proportion to the population cannot be determined, since the total sickness rate in the population is misleading when maternity cases or puerperal affections are included in a return for both sexes combined.

Of much more practical value are the sickness surveys of the Metropolitan for a number of representative cities. The sixth community survey of this company is for the principal cities of Pennsylvania and West Virginia, including special observations on the disease liability of coal miners, iron and steel mill employees, and females in coal miners' families. Of value, also, is a Health Census of Chelsea Neighbourhood, New York City, made jointly by the Metropolitan and the Chelsea Neighbourhood. Of still greater value is the sickness survey of Dutchess County, New York, by the State Charities Aid Association. Those who are employed in connection with inquiries of this kind are, however, generally wanting in the required technical qualifications. Sickness surveys, like sanitary surveys or industrial surveys, demand an exceptionally high order of trained intelligence. Henry W. Rumsey, in a

series of essays and papers on "Some Fallacies of Statistics Concerning Life and Death, Health and Disease", London, 1875, forcibly directed attention to the numerous fallacies inherent in the use of crude data, most of all when the underlying physical and pathological facts and conditions were but imperfectly understood. Rumsey was one of the first to suggest the collection of sickness statistics, observing in an address delivered as early as 1859 that "a public registration of sickness would provide a natural and obvious means of correcting mere statements of apparent results, often certified as the 'cause' of death on a cursory review of the dying or the dead". Limiting himself at the time to the registration of disease in poor-law institutions, hospitals, etc., he took occasion to point out, however, that "We may admit that even if all the diseases thus relieved and recorded were uniformly registered by competent authorities, a large proportion of sickness would still escape public notice, unless and until by the voluntary co-operation of medical practitioners the registration were extended to cases occurring in the higher and middle classes of society". In his volume of collected papers Dr. Rumsey refers to a final report of a committee of the British Medical Association, dated August 22nd, 1874, recommending to the Local Government Board the establishment of a national system of registration of diseases. Charles E. Paget, some twenty years later, published his classical essay on "Wasted Records of Disease", in which every question pertinent to the present consideration was raised, though left unanswered during the twenty years which have intervened since Paget's eloquent appeal was made jointly to the medical profession and the general public. The time has come when this demand for more trustworthy information concerning the prevailing rate of sickness can no longer be disregarded by those in public authority or by the members of the medical profession engaged in private practice. The data are required for social and economic purposes as a basis for practical measures of urgent reforms in the conditions which affect the life and the well-being not only of our wage-earners, but of the population at large.

Contrarily to the assumption that useful data of this character would be forthcoming under compulsory health insurance, the experience which has thus far been had conclusively proves that the information secured would be of decidedly limited intrinsic value.* Since a system of compulsory health insurance itself is largely responsible for a considerable

*For a full discussion of the important question as to whether the statistics derived from compulsory sickness insurance are of intrinsic value, and useful for public health and actuarial purposes, see the treatise by Wm. A. Brend, M.D., on Health and the State (p. 305, et seq.). See also his observations on the practical impossibility of correlating the provisions of the Insurance Act to the improvement of insanitary conditions on the basis of sickness experience data (p. 249, et seq.).

amount of malingering,* alleged sickness or exaggerated slight affections, the statistics secured under an experience of this kind are more generally misleading than scientifically conclusive. The practical solution is a simple requirement under which all authorized medical practitioners contribute the results of their individual experience to a collective investigation under the control of the state. A concrete illustration of what may be achieved in this direction, even on a purely voluntary basis, is the Collective Investigation Record of the British Medical Association, including contributions by Prof. Humphry, Sir W. Gull, Sir James Paget, and others, and comprehending such important questions as the communicability of phthisis, a report on acute pneumonia, chorea, acute rehumatism, etc. What was possible on a voluntary basis in 1883-84 should certainly be feasible, if necessary, on the basis of a statutory requirement at the present time.

Modern Methods of Health Education

It is possible on the present occasion to make only a brief reference to the suggested section on health education and health propaganda. The most serious objections lie against any form of ill-considered or superficial publicity, which while relatively rare is nevertheless sufficiently common to suggest an urgent word of caution. A single serious error or ill-considered statement of advice is likely to do more harm to a health organization, whetehr Federal, State or municipal, than all the good attained through a mass of irreproachable public utterances. The utmost caution is called for and only what is of real value should emanate from a Federal or a State health department, irrespective of the public clamour during a period of exceptional excitement, such as all are familiar with who passed through the epidemic of infantile paralysis or the still more recent one of influenza.† There is nothing more menacing to a public

*The most important works on malingering, with special reference, however, to the English experience under Workmen's Compensation and National Health Insurance, are the following: Malingering or the Simulation of Disease, by Jones and Llewellyn, London, 1917; Malingering and Feigned Sickness, by Sir John Collie, M.D., London, 1917; there is also an earlier work on malingering by Sir John Collie, issued in 1913, which is useful as emphasizing the increase in the tendency to malingering during recent years. A convenient summary of the evidence is included in the treatise on Health and the State by Wm. A. Brend, M.D., New York, 1917. See also my discussion of this question in Facts and Fallacies of Compulsory Health Insurance, 1916, and the Failure of German Compulsory Health Insurance, New York, 1918, in which the evidence is derived from German sources and is practically brought down to date.

†The danger of unwise publicity was never more forcibly illustrated than by the ill-advised action on the part of the Board of Health of the City of New York during the infantile paralysis epidemic of 1916. The public has a right to a statement of the facts and it is equally of right entitled to be protected against the dissemination of wrongful and misleading information, conjectures, theories and mere guesswork opinion

health service than a publicity department which considers it its duty to issue a continuous stream of bulletins, press notices, etc. It is absolutely unavoidable under such circumstances that, sooner or later, information or advice of an untrustworthy character is given publicity. The public has a right to be protected against the dissemination of ill-considered information or so-called "health news", which may be, and often is, seriously misleading or needlessly alarming. The field of health education has been enormously expanded during recent years, particularly through the co-operative efforts of health promoting agencies such as the American Public Health Association, the National Tuberculosis Association, the American Society for the Control of Cancer, the National Safety Council, the Association for the Prevention of Infant Mortality, etc. More active governmental participation in the work of these associations would materially aid in the highest attainable degree of success on the part of the Federal and State health administrations. In addition thereto, of course, the annual and special conferences of State and Territorial health authorities, under the auspices of the Federal health service, fulfill a most important function. There can be no thoroughly effective cooperation between Federal and State health authorities, unless the officials concerned know one another and know one another well.

Of the many national organizations and activities all of which are more or less in the nature of health promoting agencies, aside from those previously referred to, the following are of special importance: The Eugenics Record Office, Cold Spring Harbour; The International Health Board of the Rockefeller Foundation, New York; The American Home Economics Association, New York; the American Social Hygiene Association, New York; the American Social Hygiene Association, New York; The National Association for the Advancement of Coloured

on the part of those who are assumed to know. As well said in an editorial in the New York Sun (July 30, 1916) under the title of "A Panic in the Name of Sanitation", "We believe the authorities and particularly the Department of Health have contributed unnecessary hardships to the situation that exists and that if it does not make a radical change in its methods it will create in the name of sanitation a panic whose effects will be more terrible than anything the city has to fear from the mysterious disease to which attention is now given". Much the same criticism may be brought against the publicity mismanagement of the epidemic of influenza in the city of San Francisco, where a well-known writer on public health questions, with no thorough knowledge or understanding of the problem, urged in the most emphatic terms the universal use of the face mask on the one hand and of a but recently discovered vaccine on the other. Impartial investigations subsequently proved that the relative case rate and fatality have been lower in Los Angeles where the face mask was not adopted, and that in the opinion of the foremost authorities on vaccine treatment no safe reliance can be placed upon the use of any influenza vaccine known at the present time for either preventive or curative purposes.

People, New York; The National Board of the Young Women's Christian Association, New York; The National Child Labour Committee, New York; The National Child Welfare Association, New York; The National Committee on Mental Hygiene, New York; The National Committee for the Control of Blindness, New York; The National Conference for Social Work, Chicago; The National Organization for Public Health Nursing, New York; The Playground and Recreation Association of America, New York; The Race Betterment Foundation, Battle Creek; The Red Cross Institute for Crippled and Disabled Men, New York; The Russell Sage Foundation, New York; The International Young Men's Christian Association, New York; The Association of Industrial Physicians and Surgeons, Boston; the American Posture League, New York, and The American Physical Education Association, Springfield, Mass.

There are, of course, a number of others, working, however, chiefly in a more restricted field. Regardless of the viewpoint that there is much duplication of effort, the fact requires to be kept in mind that in what is practically a new branch of social work the strong initiative and the fixed purpose which lie back of each and all of these organizations are factors of the utmost importance in the attainment of early results of far-reaching value.*

Military and Naval Hygiene

No extended reference to the self-evident co-operation of the Federal health service with the sanitary and medical departments of the Army and the Navy, as well as with the health authorities of our non-contiguous or insular possessions, seems necessary. It is a self-evident conclusion, of course, that such co-operation in the future should not only be more active, but should follow much more carefully considered lines, based upon our war experience, than has heretofore been the case. Whether it would be necessary to make special provision for such co-operation in a separate section is debatable. Any particular question arising could probably be taken care of by the section on health administration and organization, which should be made to serve all of the more or less general administrative and co-operative functions.

*For a full discussion of the question of effective co-operation in line with the future possibilities of reorganized public health activities, see a paper on "The Present Condition of Public Health Organizations in the United States", by Prof. Selskar Gunn, American Medical Association, Chicago.

To be Continued.

Social Background

The Child of the Unmarried Mother

Rev. P. J. Bench,
Superintendent Catholic Charities, Toronto

THE subject assigned me for this afternoon, viz., "The Child of the Unmarried Mother" is so large, so many sided and so complex in its various ramifications that we must of necessity restrict ourselves to certain phases only of the world-old and world-wide problem.

In our study of this great problem we must not be guided by feelings of sympathy alone, but we must give careful thought and due consideration not only to the obligations but also to the inherent rights of all parties immediately concerned. We must also keep clearly before our minds the fact that the problem is not merely economic but that great moral issues are also involved.

I shall not delay to discuss local problems, nor those that relate to the war, to the relative merits of institutional life and private family life, nor to the placement of this type of child.

Each one of these topics is of sufficient importance in itself to form a fruitful course of study. I shall merely state in passing that it is well nigh impossible to find a sphere of human effort that has broadened out so widely as that pertaining to the welfare of the child. The child is now the object of solicitude on the part of the nation and the state. The more progressive and high minded portions of the community are bestirring themselves to watch over the child and to see that he receives all the attention and care to which he is entitled.

It is the consensus of opinion of those who have most studied the subject of child welfare that organized effort should tend in the direction of procuring for every dependent child the natural environment of children under normal conditions, namely, family life in the home.

It may be regarded as the generally accepted belief that "the natural environment of the child is the home" where the child's character and aptitudes are most favourably developed. It must be admitted that all things being equal the mother is the natural guardian of her offspring. There is a God-implanted influence exerted by every good mother on her child and there is not an institution anywhere, no matter how well equipped and governed, that can supply the necessary individual care and love so naturally and spontaneously given by the mother. I make this statement without the slightest intention of disparaging or

discrediting the excellent work being done by those in charge of our child-caring institutions. I am too familiar with institutional work to have any but words of the highest praise for those who spend themselves in that noble effort and I know that the best institutional workers agree that the natural place for the child is in the family home and that the institution, at least, should be but a temporary shelter to house and care for the child until family life can be established for him.

We shall now consider the "Child of the Unmarried Mother" from the viewpoint of his legal status in this Province, and consider reforms by way of legislation, which I believe would work in the best interests of the child and open for him the door of opportunity.

The Child's Legal Status

So far as I have been able to discover the only legal right an illegitimate child has in the Province of Ontario is the right to life.

(1) Our laws deprive the illegitimate child of practically all family rights. So far as our law is concerned the child of an unmarried mother is a *filius nullius*, that is, a child of no one.

(2) The father at common law is under no legal obligations to support the child. This legal fable, however, is modified to some extent by Provincial Statute, which provides, "that any person who furnishes food or other necessaries to any such child, may maintain an action for the value against the father of the child. No action of this kind shall be sustained unless it is shown upon the trial, that within six months after birth of the child, the mother had voluntarily made an affidavit before a Justice of the Peace for the District where she resides declaring that the person afterwards charged in the action is the father of the child and the affidavit must be deposited with the Clerk of the Peace within the time above mentioned."

This means that anyone, including the mother, may bring the action and the action may be brought in the proper Court. That is to say, if the amount claimed is under $100 it will be in the Division Court, and if the amount be over $100 it will be in the County Court.

I may state that my experience in hailing putative fathers to Court and the financial results obtained have not been such as to cause me to place any great value on the above Statute.

(3) The child has no legal right to the father's name and has no legal right to the mother's name. Such a child has no name, except that acquired by repute or where there is a baptismal name, including a surname, it will be regarded as the correct name.

(4) There is no legal obligation on the mother to support the child, although in England she is required to do so until the child reaches the age of sixteen years. There is no such provisions in this Province.

(5) The child cannot inherit either from its mother nor from its father. The only way it can receive property is through a will or a conveyance or a gift. It does not inherit as a child. An adopted child cannot inherit from its foster parents unless provided for in a will.

(6) A child born out of matrimony is not legitimatized by subsequent marriage of its parents.

(7) The mother is entitled to the custody of the child.

The Present Law Very Unfair

The child's only effective claim is in the mother whose own need is often equally as great. The law is so constituted as to render the man practically irresponsible while placing the whole burden on the mother. This disproportion is clearly unjust to the mother who is thereby required to bear the full consequences of a sin in which another shared. Still greater injustice is done to the child, who is mercilessly penalized for the sin of the parents.

Proposed Reforms

Under this heading we shall, first, examine briefly the new Norway law and the recent legislation of the state of Illinois.

The new Norway law gives to the child its natural rights to two parents. Minister Castberg, its author, says: "The essence of the law is to wipe out completely from the statute book an outrageous and unnatural fiction." Castberg denounced the legal fable that the child of an unmarried mother is a *filius nullius*, or a child of no one, and bases his law on the simple law of nature, that every child has two parents. It endeavours to establish the paternity of the child in all cases and compels the natural father to assume the same responsibility towards his offspring as does the legal father. The law further states that the child is entitled to its father's name and grants the right to maintenance and education and to inherit exactly as a legitimate child would inherit, not only from the father but from the father's relations.

Judge Fisher, of Chicago, thus comments on the Castberg law: "A careful reading would lead one to believe that the women of Norway were largely responsible for its enactment and that they have righted their wrong with a vengeance. Having carried the burden for many centuries they now seem to have thrown it completely on the other sex."

The Illinois legislation is based on the same general principles as the law of Norway, but leaves it to the discretion of the court to say whether or not the child shall have its father's name and which of the parents shall have the custody of the child provided the father desires to have it.

The bill likewise provides that a decree must issue against the father during his life time, thus avoiding spurious claims against his estate after death. At the request of the mother, or at the direction of the court, the State's Attorney will take charge of the proceedings without cost to the mother."

What We Need in Ontario

I maintain that it is high time we had a law on our Statute book concerning the child of the unmarried mother, the guiding through of which would be the welfare of the child, by compelling the father to bear his full share of the burden and responsibility of caring for and supporting the child born out of wedlock, that the door of opportunity may not be slammed in its face, that the finger of scorn may not be pointed in its direction and that it may not be publicly and forever branded with the stigma of illegitimacy.

The Provincial Board of Health.

IT will be observed in the comparative table of cases and deaths from communicable diseases reported for the month of April shows a decrease of 2,740 cases and 888 deaths compared with the previous month. The reduction is chiefly in Influenza, Pneumonia, Small-pox and Scarlet fever.

Scarlet fever and diphtheria, which have been prevalent in some localities for some months, show a reduction compared with the month of March of 73 cases and 17 deaths in the former and 33 cases in the latter.

The epidemic of measles still continues in many municipalities in the Province and caused more than twice as many deaths as scarlet fever.

CASES AND DEATHS FROM COMMUNICABLE DISEASES REPORTED BY LOCAL BOARDS OF HEALTH FOR THE MONTH OF APRIL, 1920

	April, 1920		March, 1920		April, 1919	
Diseases	*Cases*	*Deaths*	*Cases*	*Deaths*	*Cases*	*Deaths*
Smallpox	305	4	446	7	32	0
Scarlet Fever	487	12	560	29	330	7
Diphtheria	418	58	451	56	204	30
Measles	1,618	27	1,256	23	53	2
Whooping cough	135	17	136	31	48	3
Typhoid	33	14	27	7	10	3
Tuberculosis	223	193	213	173	191	152
Infantile Paralysis	...	...	...	...	...	...
Cerebro-Spinal Meningitis	7	5	1	1	12	12
Influenza	177	111	3,053	502	...	137
Influenzal Pneumonia	...	31	...	232	...	...
Acute Primary Pneumonia	...	302	...	602	...	341
Typhus Fever	...	1	...	...	...	...
	3,403	775	6,143	1,663	880	687

VENEREAL DISEASES REPORTED BY MEDICAL OFFICERS OF HEALTH

	1920	1919
	Cases	*Cases*
Syphilis	93	110
Gonorrhoea	137	139
Chancroid	7	3
	237	252

DIPHTHERIA

	Cases	*Deaths*
Toronto	164	17
Hamilton	23	3
Ottawa	31	3
Belleville	19	2
Kingston	15	2
London	12	0
St. Catharines	8	1
Brantford	5	1

News Items

The first meeting of the Advisory and Consultative Council of the Canadian Red Cross Society was held at the Headquarters of the Society, 410 Sherbourne Street, Toronto, on May 12th and 13th. The following official and voluntary Public Health Agencies were represented: Department of Health, Canada, by the Deputy Minister, Dr. J. A. Amyot; Provincial Board of Health of Ontario, by the Chief Health Officer, Dr. J. W. S. McCullough; Provincial Board of Helath of British Cloumbia, by Dr. H. E. Young; Provincial Health Department of Nova Scotia, by Dr. W. H. Hattie; Superior Board of Health of Quebec, by Hon. Dr. Henri Beland; Department of Health of New Brunswick, by Dr. G. G. Melvin.

The Canadian Red Cross Society Central Executive was represented by Dr. J. W. Robertson (who also acted as Chairman of the meeting); General G. Sterling Ryerson and Mrs. H. P. Plumptre, Honorary Secretary of the Society. The Ontario Provincial Council of the Society was represented by Dr. G. G. Nasmith, the British Columbia Branch by Mrs. Harold Fleming; the Alberta Branch by Mr. R. B. Bennett, K.C.; the Saskatchewan Branch by Commissioner Perry; New Brunswick Branch by Mr. Hays, Nova Scotia Branch by Dr. W. H. Hattie.

Other health promoting agencies were: The Canadian National Council for Combating Venereal Diseases, represented by Dr. J. G. Fitzgerald (who also acted as Secretary of the meeting) and Dr. Gordon Bates; The Canadian Association for the Prevention of Tuberculosis by the Hon. Senator Schaffner and Dr. George D. Porter; The Canadian National Committee for Mental Hygiene by Dr. C. M. Hincks; The Victorian Order of Nurses by Mrs. Hanington; The Canadian Public Health Association by Dr. Geo. E. Smith and Miss Mary Power; The Canadian Association for Nursing Education by Miss E. G. Flaws; The Canadian National Association of Trained Nurses by Miss J. Gunn; The St. John Ambulance Association by Colonel Irwin and Dr. C. A. Hodgetts; The St. John Ambulance Brigade by Colonel Noel Marshall.

The full proceedings of this most important Conference, which had for its purpose the complete co-ordination of the activities of all official and voluntary Public Health Agencies will be published in an early number of the PUBLIC HEALTH JOURNAL.

Mr. George A. Hastings, Mental Hygiene Expert of the New York Charity Organization Society was a recent visitor in Toronto.

During his stay Mr. Hastings attended the Red Cross Conference, addressed the meeting of the Ontario Provincial Association for the Care of the Feeble-minded and spoke at the Graduation Exercises of The Department of Social Service of the University of Toronto. A dinner was given in his honour by Mrs. A. M. Huestis, Hon. President of the Ontario Feeble-Minded Association on the evening of May 14th.

Dr. George D. Porter, General Secretary of The Canadian Association for the Prevention of Tuberculosis, addressed eleven meetings in the City of Quebec during the week of May 17th.

A meeting of the Dominion Council of Health, the Advisory Body to the Department of Health, Canada, was held in the Board Room of the Department in Ottawa on May 17th, 18th and 19th.

Dr. Helen MacMurchy has been appointed Chief of the Division of Child Welfare of the Department of Health, Canada.

Dr. A. Grant Fleming, M.C., has been appointed Chief of the Division of Venereal Diseases of the Department of Health, Canada.

Dr. J. G. Fitzgerald, Professor of Hygiene and Preventive Medicine, and Director of the Connaught Antitoxin Laboratories, University of Toronto, has been appointed Honorary Advisor in Public Health to the Canadian Red Cross Society. Dr. Fitzgerald will act in a voluntary capacity and for a period to extend over the next four or five months.

The Annual Meeting of the Provincial Association for the Care of the Feeble-Minded was held in Toronto on May 13th. Mrs. A. M. Huestis presided at the meeting and Dr. O. C. J. Withrow acted as Secretary.

An important meeting of the Executive Council of the Canadian Public Health Association was held in Toronto on May 14th. Those in attendance were: President, Dr. H. E. Young, Victoria; Dr. W. H. Hattie, Halifax; Dr. G. G. Melvin, St. John; Dr. C. A. Hodgetts, Ontario; Dr. M. R. Bow, Regina; Dr. J. W. S. McCullough, Dr. C. J. Hastings, Dr. R. D. Defries, Mrs. A. M. Huestis, Dr. Gordon Bates, Dr. J. G. Fitzgerald and Dr. Geo. D. Porter, Toronto.

A meeting of the Executive of the Canadian National Council for Combating Venereal Diseases was held at the Head Office of the Association, 154 Bay Street, Toronto, on May 20th.

Dr. H. C. Cruikshank has been recommended by the Medical Officer of Health, Dr. C. J. Hastings, for the position of Director of Laboratories, Department of Health, Toronto, in succession to Dr. A. Grant Fleming. Dr. Cruikshank has, for some time, been Bacteriologist in the Research Division, Connaught Antitoxin Laboratories, University of Toronto.

The Congress to be held in Vancouver commencing June 21st seems likely to be one of the most interesting Public Health and Medical gatherings of recent years. The attendance promises to be very large, and most excellent programmes have been arranged for.

The organization meeting of the Saskatchewan Committee of the Canadian National Council for Combating Venereal Diseases was held in the City Council Chamber, Regina, on Friday, April 30th. Sir Richard Lake presided and Rev. Hugh Dobson, Provincial Chairman of the National Council and Dr. M. M. Seymour, Health Commissioner for the Province, addressed the meeting on the plans of the Government for attacking the Venereal Disease problem. A constitution was adopted and an Executive Committee was appointed consisting of the following members:

Dr. Turnbull, Dr. Corbett, Chief of Police Bruton, Nurse Armstrong, Alderman Borlase, Rev. Fr. Gillies, Rev. W. Western, Rev. H. Dobson, Dr. Robb, of Regina; Dr. MacNeil, North Battleford; Chief of Police Johnston, Moose Jaw; Mrs. Graham, Moose Jaw; Mrs. Myers, Saskatoon; C. M. Johnson, Saskatoon, and Dr. T. A. Patrick, of Yorkton.

Editorials

THE CAMPAIGN FOR MEMBERSHIP

The campaign for new members in the Canadian Public Health Association is meeting with great success, and returns indicate that the objective of one thousand will be reached before June 30th, the date set for the end of the campaign.

Towards Ontario's objective of three hundred there are already one hundred and fifty new members. Quebec reports that its quota will be exceeded by over fifty per cent. Nova Scotia has reached thirty-five per cent. of its objective and British Columbia sends word that its quota will be exceeded by fifty per cent. Prince Edward Island is the banner Province in the Campaign. Summerside P.E.I. holds the unique position of having enrolled the entire Provincial quota of new members. Reports from other parts of the Province indicate that the total enrollment will be a record. In Ontario through the efforts of a committee of the District Officers of Health no less than seventy-five per cent. of the Health Officers attending the recent convention of the Ontario Health Officers became members of the Association.

The results tabulated above are admirable, and show the unity of purpose of our Canadian Health Workers. Rapid advances in Public Health must depend on the enlisting of wide-spread sympathy for Public Health Ideals and every new member will make the Association and its JOURNAL stronger. Wide-spread membership will mean that information on Public Health matters essential to advance in the physical and mental status of the average citizen will be widely disseminated. This must have its influence on public opinion and wisely formed public opinion is our greatest asset. The PUBLIC HEALTH JOURNAL urges each of its readers to do his or her part in procuring new members. The campaign is on. Do it now.

CHILD WELFARE SECTION

PLANS under consideration by the Child Welfare Section of the Canadian Public Health Association would indicate that the Section will soon develop into a most important factor in the Association's work. A recent grant of five thousand dollars by the Canadian Red Cross has made it possible to commence organization. Offices

have been procured. Miss E. M. Forsythe who is well qualified for the work has been appointed National Secretary and a campaign confined to scientific publicity will be undertaken at once.

It is understood that the co-operation of well-known leaders in this field of preventive medicine will be enlisted in the preparation of press material, posters, moving-pictures, etc., and that money will be raised to cover a budget of about fifteen thousand dollars for the first year's work.

Public Health leaders throughout the country will welcome this news. Opportunities for voluntary organizations to undertake leadership in various phases of public health work are increasingly great. In this particular field it is high time that intensive work should commence. That it will commence is assured. That whatever is done will be well done is also assured, by the fact that the work has been commenced under correct auspices by men and women who are themselves authorities.